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10/568,507	02/16/2006	Nobuko Yamamoto	03500103811	1163

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EXAMINER	
CROW, ROBERT THOMAS	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/568,507	YAMAMOTO, NOBUKO	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-21* is/are pending in the application.

4a) Of the above claim(s) *15-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 4-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 16 October 2008 in which claims 1, 4, 6, 8-9, and 11-12 were amended, claims 2-3 were canceled, and no new claims were added. All of the amendments have been thoroughly reviewed and entered.

The objections to the claims listed in the previous Office Action are withdrawn in view of the amendments.

The previous rejections of claims 3, 6, and 11 under 35 U.S.C. 112, second paragraph, are withdrawn in view of the amendments. However, the rejection of claims 7-8 under 35 U.S.C. 112, second paragraph, is maintained and reiterated below. Applicant's arguments have been thoroughly reviewed and are addressed following the rejections. In addition, new rejections necessitated by the amendments are also presented.

The previous rejections under 35 U.S.C. 103(a) not reiterated below are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are addressed following the rejections necessitated by the amendments.

Claims 1 and 4-14 are under prosecution.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 and 4-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claims 1 and 4-14 are indefinite in claim 1, which recites the limitation "wherein the two or more areas immobilize different amounts of probes depending on the target substances to be reacted with the probes immobilized in the areas" at the end of the claim. This is a new rejection necessitated by the amendments. The recitation is indefinite because the amount of probes depends on the amount of target, which is not a structural limitation of the claimed carrier. Thus, it is unclear if a carrier having multiple areas of amounts of probes against a novel set of targets thereon in accordance with claim 1 would be infringed upon merely because different sample comprising a different ratio of target substances complementary to the same probe carrier is isolated. For example, a first sample has one million copies of a first target and 10 million copies of a second target. A probe carrier is then prepared in accordance with claim 1, which has one million copies of a probe to the first target in one spot in a first area and five million copies of a probe to the second target in each of two spots in a second area. The carrier is then used with a different second sample having 20 million copies of each of both of the targets. The metes and bounds of the claims are thus unclear because the same carrier infringes claim 1 if it is used with the first sample but does not infringe claim 1 if it is used with the second sample. Therefore, infringement could not be assessed and the claim is indefinite.

B. Claims 7-8 are indefinite in the claim 7, which recites the limitation "the number of the immobilized probe molecules per spot is of the same order to the lowest number of mRNA molecules of a target gene present in a sample" at the end of claim 7. This rejection is maintained from the previous Office Action. The recitation is indefinite because the number of probe molecules depends on the amount of target, wherein the target is a separate entity that is not a structural limitation of the claimed carrier. Thus, it is unclear if a carrier having multiple areas of probes thereon would infringe on claim 7 merely because an mRNA sample is prepared that happens to have a number of molecules equal to the number of molecules per spot of the carrier. For example, a first sample has only ten thousand copies of a first target mRNA molecule and 10 million copies of a second target. A probe carrier is then prepared in accordance with claim 7 so that the spot in the first area and the two spots in the second area each have only ten thousand copies. The carrier is then used with a different sample having fifty thousand copies of each of the targets. The metes and bounds of the claims are thus unclear because the same carrier infringes claim 7 if it is used with the first sample but does not infringe claim 7 if it is used with the second sample. Therefore, infringement could not be assessed and the claim is indefinite.

4. The remaining rejections are new rejections necessitated by the amendments.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4-6, 9-10, 12, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Kronick et al (U.S. Patent Application Publication No. US 2004/0115722 A1, published 17 June 2004).

Regarding claim 1, Kronick et al teach a probe carrier comprising a carrier in the from of a solid support (Abstract and Figure 6) having thereon a plurality of probe spots (i.e., features; paragraph 0063). Each of the different probes is capable of specifically binding to a target substance (paragraph 0090); thus, the plurality of probes are capable of binding to a plurality of target substances. The spots are contained within individual arrays (i.e., 12g-12m and 12n-12t of Figure 6; paragraph 1119), which are confined to two separate areas of substrate 15. A review of the specification yields no limiting definition of, or any specific structural limitations required for, a "reaction region" or "independent areas separated from each other." Thus, the area of carrier 15 containing the two rows of circular arrays 12g-12m and 12n-12t is interpreted as the claimed "reaction region," the two rows of arrays (i.e., the row containing 12g-12m and the row containing 12n-12t) is interpreted as "independent areas separated from each other" and the claim has been given the broadest reasonable interpretation consistent with the

teachings of the specification regarding a "reaction region" and "independent areas separated from each other" (*In re Hyatt*, 211 F.3d1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (see MPEP 2111 [R-1]).

Each of arrays 12g-12m have the same layout and probe composition with higher probe density (i.e., amount) going from array 12g to 12m, while each of arrays 12n-12t have the same layout and probe composition with higher probe density (i.e., amount) going from array 12n to 12t but have different probes than the arrays 12g to 12m, and each of the probe compositions in the two sets of arrays are based on the suspected target abundance (paragraphs 0063 and 0102). Each series of arrays comprises spots of the same probes; namely, all the copies of a particular probe are immobilized as two or more replicate features (i.e., spots) within the array (paragraph 0102). Thus, arrays 12g-12m all comprise identical patterns of at least two spots of the same probe in different densities based on a first target (i.e., based on a first probe sequence), arrays 12n-12t all comprise identical patterns at least two spots of the same probe in different densities based on a second target (i.e., based on a second probe sequence). Because each set of arrays is of replicate features, different kinds of probes are not immobilized in each area. Because the amount of each probe in the two sets of arrays is based on the abundance of each of two different targets (i.e., one for each probe), the amount of probes in the first set of arrays is different for the amount of probes in the second set of arrays.

Regarding claim 4, Kronick et al teach the probe carrier of claim 1, wherein the two are more areas are aligned in a first direction and adjacent areas are separated in a

direction vertical to the first direction; namely, 90 degree clockwise rotation of Figure 6 aligns area 12n-12t horizontally with area 12g-12m, and adjacent area 356 is separated vertically (i.e., is below) the two areas.

It is noted that neither the claim nor the specification required the "adjacent areas" to be areas comprising probe spots; thus, the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding "adjacent areas."

Regarding claim 5, Kronick et al teach the probe carrier of claim 1.

It is noted that a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories,* 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Upsher-Smith Labs. v. Pamlab, LLC*, 412 F.3d 1319, 1323, 75 USPQ2d 1213, 1215 (Fed. Cir. 2005)(reference disclosing optional inclusion of a particular component teaches compositions that both do and do not contain that component); Celeritas Technologies Ltd. v. Rockwell International Corp., 150 F.3d 1354, 1361, 47 USPQ2d 1516, 1522-23 (Fed. Cir. 1998) (The court held that the prior art anticipated the claims even though it taught away from the claimed invention. "The fact that a modem with a single carrier data signal is shown to be less than optimal does not vitiate the fact that it is disclosed."). Thus, the teaching of Kronick et al that the copy of nucleic acids on the array **may** be varied (paragraph 0117) encompasses the alternate embodiment wherein the amount of nucleic acid is

not varied; i.e., the spots have the same amount of nucleic acid therein. See MPEP § 2123 [R-5].

Thus, Kronick et al teach a range of numbers of nucleic acids per spot ranging from different probe densities (i.e., numbers) per spot (paragraph 0119) to the same number of nucleic acids per spot (paragraph 0117).

It is noted that a review of the specification yields no limiting definition of the similarity of amounts encompassed by the phrase “practically equal.”

Therefore, the range of probe numbers per spots taught by Kronick et al encompasses the “practically equal” number of immobilized probe molecules per spot of the instant claim because the metes and bounds of the phrase "practically equal" are not limited by any statements in the specification. Thus, the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding amounts that are "practically equal."

Regarding claim 6, Kronick et al teach the probe carrier of claim 1, wherein each of the immobilized probes is a nucleic acid (paragraph 0030).

Regarding claim 9, Kronick et al teach the probe carrier of claim 1, wherein the amount of immobilized probes varies between different areas; namely, because the amount of each probe in the two sets of arrays is based on the abundance of each of two different targets (i.e., one for each probe), the amount of probes in the first set of arrays is different for the amount of probes in the second set of arrays.

Regarding claim 10, Kronick et al teach the probe carrier of claim 1, wherein the application of probes to be immobilized is performed by an ink jet method (paragraph 0167).

In addition, it is further noted that the courts have stated:

> "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP§ 2113.

Thus, while Kronick et al specifically teach ink jet methods, these limitations are part of the process of making the probe carrier rather than structural limitations of the probe carrier. Because Kronick et al teaches the structural elements of the claim, the claim is clearly anticipated by Kronick et al.

Regarding claim 12, Kronick et al teach the probe carrier of claim 1, wherein the two or more areas have a same area; namely, Figure 6 shows the areas of 12g-12m and 12n-12t to be the same.

In addition, as noted above, a review of the specification yields no limiting definition of, or any specific structural barriers required for "independent areas separated from each other." The carrier of Figure 6 can therefore be subdivided into first and second areas of equal total area wherein the first area of the carrier includes 12g-12m and a surrounding area that does not overlap with the second area of the carrier, wherein the second area includes 12n-12t and a surrounding area that does not overlap with the first area of the carrier. Thus, the claim has been given the broadest

reasonable interpretation consistent with the teachings of the specification regarding a "independent areas separated from each other."

Regarding claim 14, Kronick et al teach the probe carrier of claim 1, wherein the carrier is a plate substrate (paragraph 0127).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronick et al (U.S. Patent Application Publication No. US 2004/0115722 A1, published 17 June 2004) in view of Roesl et al (U.S. Patent Application Publication No. US 2002/0106355 A1, published 8 August 2002).

It is noted that this rejection applies to claims 1 and 6 to the extent that they are drawn to the embodiments of dependent claims 7-8.

Regarding claim 7, Kronick et al teach the probe carrier of claim 1 comprising a carrier in the form of a solid support (Abstract and Figure 6) having thereon a plurality of probe spots (i.e., features; paragraph 0063). Each of the different probes is capable of specifically binding to a target substance (paragraph 0090); thus, the plurality of probes are capable of binding to a plurality of target substances. The spots are contained

within individual arrays (i.e., 12g-12m and 12n-12t of Figure 6; paragraph 1119), which are confined to two separate areas of substrate 15. A review of the specification yields no limiting definition of, or any specific structural limitations required for, a "reaction region" or "independent areas separated from each other." Thus, the area of carrier 15 containing the two rows of circular arrays 12g-12m and 12n-12t is interpreted as the claimed "reaction region," the two rows of arrays (i.e., the row containing 12g-12m and the row containing 12n-12t) is interpreted as "independent areas separated from each other" and the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding a "reaction region" and "independent areas separated from each other."

Each of arrays 12g-12m have the same layout and probe composition with higher probe density (i.e., amount) going from array 12g to 12m, while each of arrays 12n-12t have the same layout and probe composition with higher probe density (i.e., amount) going from array 12n to 12t but have different probes than the arrays 12g to 12m, and each of the probe compositions in the two sets of arrays are based on the suspected target abundance (paragraphs 0063 and 0102). Each series of arrays comprises spots of the same probes; namely, all the copies of a particular probe are immobilized as two or more replicate features (i.e., spots) within the array (paragraph 0102). Thus, arrays 12g-12m all comprise identical patterns of at least two spots of the same probe in different densities based on a first target (i.e., based on a first probe sequence), arrays 12n-12t all comprise identical patterns at least two spots of the same probe in different densities based on a second target (i.e., based on a second probe sequence). Because

each set of arrays is of replicate features, different kinds of probes are not immobilized in each area. Because the amount of each probe in the two sets of arrays is based on the abundance of each of two different targets (i.e., one for each probe), the amount of probes in the first set of arrays is different for the amount of probes in the second set of arrays.

Kronick et al also teach the probe carrier of claim 6, wherein each of the immobilized probes is a nucleic acid (paragraph 0030).

While Kronick et al teach the probes are to a target mRNA in a sample (paragraph 0053), Kronick et al do not explicitly teach that the number of probe molecules is of the same order to the lowest number of mRNA molecules of a target gene present in a sample.

However, Roesl et al teach a carrier in the form of a nitrocellulose strip wherein equal amounts (i.e., counts) of nascent mRNA is hybridized the same amount of probes on the strip (Figure 2 and paragraphs 0033 and 0066). It is noted that a review of the specification yields no limiting definition of the range of values encompassed by the term "of the same order." Thus, the equal amounts of immobilized probe and the nascent mRNA as taught by Roesl et al are interpreted as being “of the same order,” and the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding a “of the same order.” Roesl et al also teach the hybridization of equal amounts of the immobilized probe and the mRNA in the sample has the added advantage of allowing direct comparison of the degree of transcription (i.e., mRNA production) of the gene of interest with other genes in the

sample (paragraph 0066). Thus, Roesl et al teach the known technique of having the amount of immobilized probes of the same order as the lowest number of mRNA molecules in the sample.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the carrier having different probes for different mRNA targets immobilized in each spot as taught by Kronick et al so that the amount of each probe in each spot is of the order of the lowest number of molecules or mRNA complementary to the probe as taught by Roesl et al to arrive at the instantly claimed carrier with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a carrier having the added advantage of allowing direct comparison of the degree of transcription (i.e., mRNA production) of the gene of interest with other genes in the sample (paragraph 0066) as explicitly taught by Roesl et al (paragraph 0066). In addition, it would have been obvious to the ordinary artisan that the known technique of having the amount of each probe of the order of the lowest number of molecules or mRNA complementary to the probe as taught by Roesl et al could have been applied to each spot of the carrier of Kronick et al with predictable results because the known technique of having the amount of each probe of the order of the lowest number of molecules or mRNA complementary to the probe as taught by Roesl et al predictably results in a probe ratio allowing the testing of regulation of gene expression.

Regarding claim 8, the carrier of claim 7 is discussed above. Kronick et al teach number of spots in each of the areas in proportional to an average amount of expression, in a human, of the target gene having a sequence complementary to the probe; namely, each area has at least 2 spots (paragraph 0102), and the spots measure gene expression (paragraph 0166). The claim does not define a specific ratio for the claimed proportion. In addition, a review of the specification yields no limiting definition of a range of number encompassed by the phrase “is proportional to.” Thus, because the average amount of expression of a target gene can be divided by a number such that the ratio produced is 2, the at least two spots of Kronick et al are proportional to an average amount of expression of the target gene having a sequence complementary to the probe, and the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding amounts that are "proportional to."

While Kronick et al do not specifically teach the gene expression is measured in humans, Roesl et al teach the detection of expression in humans has the added advantage of allowing detection of diseases associated with cancer (paragraph 0002). Thus, Roesl et al teach the known technique of detection gene expression in a human.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the carrier having different probes for measuring gene expression as taught by Kronick et al in view of Roesl et al so that the gene expression is measured in a human as taught by Roesl et al to arrive at the instantly claimed carrier with a reasonable expectation of success. The ordinary

artisan would have been motivated to make the modification because said modification would have resulted in a carrier having the added advantage of allowing detection of diseases associated with cancer as explicitly taught by Roesl et al (paragraph 0002). In addition, it would have been obvious to the ordinary artisan that the known technique of measuring gene expression in a human as taught by Roesl et al could have been applied to the carrier of Kronick et al in view of Roesl with predictable results because the known technique of measuring gene expression in a human as taught by Roesl et al predictably results in carrier useful in detecting cancer in humans.

9. Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronick et al (U.S. Patent Application Publication No. US 2004/0115722 A1, published 17 June 2004).

It is noted that this rejection applies to claim 1 to the extent that it is drawn to the embodiment of dependent claim 11.

Regarding claim 11, Kronick et al teach the probe carrier of claim 1 comprising a carrier in the form of a solid support (Abstract and Figure 6) having thereon a plurality of probe spots (i.e., features; paragraph 0063). Each of the different probes is capable of specifically binding to a target substance (paragraph 0090); thus, the plurality of probes are capable of binding to a plurality of target substances. The spots are contained within individual arrays (i.e., 12g-12m and 12n-12t of Figure 6; paragraph 1119), which are confined to two separate areas of substrate 15. A review of the specification yields no limiting definition of, or any specific structural limitations required for, a “reaction

region" or "independent areas separated from each other." Thus, the area of carrier 15 containing the two rows of circular arrays 12g-12m and 12n-12t is interpreted as the claimed "reaction region," the two rows of arrays (i.e., the row containing 12g-12m and the row containing 12n-12t) is interpreted as "independent areas separated from each other" and the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding a "reaction region" and "independent areas separated from each other."

Each of arrays 12g-12m have the same layout and probe composition with higher probe density (i.e., amount) going from array 12g to 12m, while each of arrays 12n-12t have the same layout and probe composition with higher probe density (i.e., amount) going from array 12n to 12t but have different probes than the arrays 12g to 12m, and each of the probe compositions in the two sets of arrays are based on the suspected target abundance (paragraphs 0063 and 0102). Each series of arrays comprises spots of the same probes; namely, all the copies of a particular probe are immobilized as two or more replicate features (i.e., spots) within the array (paragraph 0102). Thus, arrays 12g-12m all comprise identical patterns of at least two spots of the same probe in different densities based on a first target (i.e., based on a first probe sequence), arrays 12n-12t all comprise identical patterns at least two spots of the same probe in different densities based on a second target (i.e., based on a second probe sequence). Because each set of arrays is of replicate features, different kinds of probes are not immobilized in each area. Because the amount of each probe in the two sets of arrays is based on the abundance of each of two different targets (i.e., one for each probe), the amount of

probes in the first set of arrays is different for the amount of probes in the second set of arrays.

While Kronick et al do not specifically teach the maximum number of spots in the arrays in the 12g-12m area differs 100 to 1000 times between the minimum number of spots of the arrays in the 12n-12t area of Figure 6, Kronick et al do teach each array has a different number of spots (i.e., feature number; paragraph 0090). Kronick et al also teach the number of spots of a typical array is about ten or about ten thousand (paragraph 0116). The embodiment of Figure 6 has each of the arrays 12g-12m having the same number of spots, and each of the arrays 12n-12t having the same number of spots as described above. Thus, in the embodiment wherein array 12g has 10 spots and array 12n has 10,000 spots (paragraph 0016), arrays 12g-12m collectively have 70 spots total (i.e., 7 arrays of 10 spots), and arrays 12n-12t collectively have 70,000 spots total (i.e., 7 arrays of 10,000 spots), and the ratio is 1000 between the minimum number of spots (i.e., arrays 12g-12m) and the maximum number of spots (i.e., arrays 12n-12t).

10. Claims 1 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kronick et al (U.S. Patent Application Publication No. US 2004/0115722 A1, published 17 June 2004) in view of Yamamoto et al (U.S. Patent Application Publication No. US 2002/0147330 A1, published 10 October 2002).

It is noted that this rejection applies to claim 1 to the extent that it is drawn to the embodiment of dependent claim 13.

Regarding claim 13, Kronick et al teach the probe carrier of claim 1 comprising a carrier in the form of a solid support (Abstract and Figure 6) having thereon a plurality of probe spots (i.e., features; paragraph 0063). Each of the different probes is capable of specifically binding to a target substance (paragraph 0090); thus, the plurality of probes are capable of binding to a plurality of target substances. The spots are contained within individual arrays (i.e., 12g-12m and 12n-12t of Figure 6; paragraph 1119), which are confined to two separate areas of substrate 15. A review of the specification yields no limiting definition of, or any specific structural limitations required for, a "reaction region" or "independent areas separated from each other." Thus, the area of carrier 15 containing the two rows of circular arrays 12g-12m and 12n-12t is interpreted as the claimed "reaction region," the two rows of arrays (i.e., the row containing 12g-12m and the row containing 12n-12t) is interpreted as "independent areas separated from each other" and the claim has been given the broadest reasonable interpretation consistent with the teachings of the specification regarding a "reaction region" and "independent areas separated from each other."

Each of arrays 12g-12m have the same layout and probe composition with higher probe density (i.e., amount) going from array 12g to 12m, while each of arrays 12n-12t have the same layout and probe composition with higher probe density (i.e., amount) going from array 12n to 12t but have different probes than the arrays 12g to 12m, and each of the probe compositions in the two sets of arrays are based on the suspected target abundance (paragraphs 0063 and 0102). Each series of arrays comprises spots of the same probes; namely, all the copies of a particular probe are immobilized as two

or more replicate features (i.e., spots) within the array (paragraph 0102). Thus, arrays 12g-12m all comprise identical patterns of at least two spots of the same probe in different densities based on a first target (i.e., based on a first probe sequence), arrays 12n-12t all comprise identical patterns at least two spots of the same probe in different densities based on a second target (i.e., based on a second probe sequence). Because each set of arrays is of replicate features, different kinds of probes are not immobilized in each area. Because the amount of each probe in the two sets of arrays is based on the abundance of each of two different targets (i.e., one for each probe), the amount of probes in the first set of arrays is different for the amount of probes in the second set of arrays.

Kronick et al do not teach the carrier is a tape.

However, Yamamoto et al teach a probe carrier in the form of a tape, which has the added advantage of having improved efficiency in the manufacturing of the probe carrier (i.e., the deposition of the probes on the carrier; Abstract). Thus, Yamamoto et al teach the known technique of using a tape as a probe carrier.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the probe carrier as taught by Kronick et al so that the carrier substrate is a tape as taught by Yamamoto et al to arrive at the instantly claimed carrier with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a carrier having the added advantage of having improved efficiency the deposition of the probes on the carrier, thus resulting in improved

efficiency in the manufacturing of the probe carrier, as explicitly taught by Yamamoto et al (Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the tape carrier of Yamamoto et al could have been used as the substrate in the carrier of Kronick et al with predictable results because the known technique of using the tape carrier of Yamamoto et al predictably results in a carrier useful for DNA probe arrays.

Response to Arguments

11. Applicant's arguments filed 16 October 2008 (hereafter the "Remarks") have been fully considered but they are not persuasive for the reason(s) listed below.

A. Applicant argues on page 7 of the Remarks that there in nothing inherently wrong with defining some parts of an invention in functional terms, based on MPEP 2173.05(g).

Applicant is correct that some parts of an invention can be described in functional terms. However, as noted above, the indefinite limitations present in claim 1 (i.e., "wherein the two or more areas immobilize different amounts of probes depending on the target substances to be reacted with the probes immobilized in the areas) and in claim 7 (i.e., "the number of the immobilized probe molecules per spot is of the same order to the lowest number of mRNA molecules of a target gene present in a sample") are each based upon the target, neither of which is a part of claimed probe carrier. For example, with respect to claim 1, a sample has one million copies of a first target and 10 million copies of a second target. A probe carrier is then prepared in accordance with

claim 1, which has one million copies of a probe to the first target in one spot in a first area and five million copies of a probe to the second target in each of two spots in a second area. The carrier is then used with a different sample having 20 million copies of each of both of the targets. The same carrier infringes claim 1 if it is used with the first sample but does not infringe claim 1 if it is used with the second sample.

Similarly, with respect to claims 7-8, a sample has only ten thousand copies of a first target mRNA molecule and 10 million copies of a second target. A probe carrier is then prepared in accordance with claim 7 so that the spot in the first area and the two spots in the second area each have only ten thousand copies. The carrier is then used with a different sample having fifty thousand copies of each of the targets. The same carrier infringes claim 7 if it is used with the first sample but does not infringe claim 7 if it is used with the second sample.

Therefore, the new rejection of claims 1 and 4-14 and the maintained rejection of claims 7-8 under 35 USC 112, second paragraph are each proper.

B. Applicant's remaining arguments with respect to the previous rejections of the claims have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendments.

Conclusion

12. No claim is allowed.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

14. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571)272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 1634

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